Bearing in mind the importance of the subject, and remembering, as my colleagues and myself do, the difficulties we have had to encounter and those we have still before us, I am strongly of opinion that the erection and maintenance of colleges of science should not be left to the accidental liberality of the few, but should be taken in hand by the nation at large.

NOTES.

AMONGST the recent scientific missions undertaken by order of the French Government are: one by Prof. Viault, of Bordeaux, in the table-lands of Peru, Ecuador, and Bolivia, to continue the investigations of the late M. Paul Bert into rarefied air; one by M. de Coubertin, Secretary of the Committee for the Encouragement of Physical Exercises in Education in the United States and Canada, to visit the Universities and Colleges, to study the working of the various athletic associations frequented by the young people of these countries; one by M. Jacques de Morgan, mining engineer, to explore those parts of Asia Minor lying between the south of the Caspian Sea, Armenia, the Gulf of Alexandria, and Anti-Taurus (this mission will occupy two years and three months); and one by M. Candelier, to Columbia, to make ethnographical researches and collections for the State.

MESSRS. LONGMANS have made arrangements with Dr. Nansen for the publication, both in London and New York, of an account of his recent expedition across Greenland. The book will be fully illustrated, and will probably be published in the spring of next year.

THE twenty-sixth annual meeting of the British Pharmaceutical Conference was opened at the Durham University College of Science, Newcastle, on the 10th inst., when the President, Mr. C. Umney, delivered the annual address.

THE Department of Botany, British Museum, has acquired the collection of microscopic slides made by the late Prof. de Bary.

A CORRESPONDENT of the *Daily Chronicle* states that particulars have reached Constantinople, of a volcanic eruption which occurred some days ago in the province of Erzeroum, destroying the village of Kantzorik, and the majority of its inhabitants. Kantzorik was a little village of 215 inhabitants, situated in the Caza of Tortoum, about 60 kilometres north of the city of Erzeroum. The village nestled in a narrow fertile valley about 1600 metres above the level of the sea, on the slope of the eastern mountains. Before the eruption the inhabitants were startled by subterranean noises, and they noticed at the same time that the springs on a mountain which stands at the eastern end of the valley were dried up. Alarmed at these phenomena they appealed to the nearest local authorities, and were advised at once to evacuate the village. The warning for the majority was too late. Towards midday, whilst the terrified peasants were preparing for flight, the eruption came. The torrent rushed down, bearing on its molten surface boulders and masses of earth torn from the surface or belched from the heart of the mountain. The whole village, with 136 persons, was engulfed in the stream.

IT is reported from Japan that Viscount Ennomoto, the new Minister of Education, is devoting special attention upon the introduction of technical education into the primary schools of the Empire, and that he has turned to Italy as a model. His scheme is to include technical education in the curriculum of the preparatory schools, and to give children technical training from the outset.

MR. BOTHAMLEY, Assistant Lecturer and Demonstrator in the Chemical Department of the Yorkshire College, has been unanimously elected President of the Photographic Convention of the United Kingdom for the meeting in 1890, which is to be held at Chester.

THE "Hand-book of Newcastle and District," compiled in view of the meeting of the British Association there this year, consists of three parts, a third being on the geology of the district. The volumes are very neatly got up and well printed. The general hand-book is by the Rev. Dr. Collingwood Bruce, the greatest living authority on the antiquities and history of the district, who has succeeded in making a highly readable and instructive volume. In a short introduction he shows the immense progress made by Newcastle since the last two visits of the Association, and especially since the introduction of railways. Dr. Bruce gives many reminiscences of the old life of Newcastle, and interesting details as to its historical buildings, as well as its modern institutions. In an appendix, brief descriptions are given of the places of interest in the vicinity of Newcastle arranged in alphabetical order. The second volume is devoted to the industries of Newcastle and the north-east coast, and is edited by Mr. Wigham Richardson. Each section is written by a specialist, and the whole is well illustrated by a fine series of maps and diagrams. We have chapters on agriculture, by Mr. Thomas Bell; railways from the Tweed to the Tees, by Mr. W. G. Laws; the harbours of the north-east coast, by Mr. P. J. Messent; mining and quarrying, by Mr. J. Boland Anderson; engineering, by Mr. W. Boyd; shipbuilding, by Mr. J. A. Rowe; electricity, by the Hon. C. A. Parsons; manufacture of iron and steel, by Mr. C. Lowthian Bell; lead, by Mr. N. C. Cookson; copper, by Mr. George Gatherall; antimony, by Mr. N. C. Cookson; zinc, by Mr. John Pattison; aluminium, by Mr. Curt Netto; chemical manufactures, by Mr. T. W. Stuart; gas-works, by Mr. W. Hardie; printing, by Mr. Sidney Reid; manufacture of paper, by Mr. W. H. Richardson; flour milling, by Mr. Edmund Procter; leather manufacture, by Mr. D. Richardson; tanning, by Mr. G. Angus; coachbuilding, by Mr. J. Philipson; earthenware, by Mr. H. Heath and Mr. C. T. Maling; photography, by Mr. Edwin Dodds; carpeting, by Mr. A. Henderson; cement, by Mr. J. Watson; the development of the Portland cement industry, by Mr. J. L. Spoor; ropemaking, by Mr. R. Dixon; the brewing trade, by Mr. T. W. Lovibond; tobacco, by Mr. J. Harvey; with a concluding section by the editor. The geology section is by Prof. Lebour, and is much above the average of similar hand-books.

DR. RUDOLPH KOENIG, the well-known constructor of standard acoustical apparatus in Paris, has just made a discovery of extreme importance in the theory of music, the details of which he will expound at the forthcoming meeting of the Naturforscher at Heidelberg. This is an extension of Helmholtz's theory of *timbre* to certain cases not represented in the elementary mathematical theory, and corresponding to the actual case of the *timbres* of certain musical instruments. The paper is certain to give rise to discussion, and will be of interest to musicians, who have never, as is notorious, taken kindly to Helmholtz's theory in its original form.

FROM an official summary of the proceedings at the German Anthropological Congress, which met at Vienna last month, it appears that after Prof. Ranke had read the year's report, in which the establishment of chairs of anthropology at German Universities was specially mentioned, Prof. Virchow read a paper on the progress of anthropology in the last twenty years. He thought in the next twenty years anthropologists would be able to explain the connection of the various races and peoples of Europe. Prof. Schaafhausen dealt with the present condition of the study of crania for anthropological purposes, and Prof. Ranke with the position of the ears in different races. Dr. Waldeyer described certain investigations of his into the placenta in the human species and in apes, while Prof. Zuckerkandl spoke of the physical qualities of the inhabitants of Styria and Carinthia. Amongst other papers were the following:—Dr. Hoernes, the present position of prehistoric studies in Austria; Herr Troeltsch, the protection of prehistoric antiquities; Dr. Woldrich, the Stone Age in Central Europe; Prof. Virchow, "Crania Americana"; and quite a number of writers described particular prehistoric discoveries, "finds" of bronzes, stone implements, &c.

On Thursday afternoon last a statue was erected at the Veterinary School at Alfort to the memory of Henri Bouley, who after being a professor there, held a chair at the Museum of Natural History, and who before the close of his career was President of the Academy of Sciences. He was the author of books on veterinary medicine and rural economy, which gave a great impulse to French agriculture. He made successful efforts to raise the education and social position of veterinary surgeons. The statue bears the words, "To Henri Bouley, 1814–1885; his pupils and his friends."

Recently we referred to an entomological tour about to be undertaken in Ceylon on behalf of certain German Museums, by Herr Frühstorfer, a Berlin naturalist. The Ceylon papers now contain an account of the tour in the island, and its results, from which it appears that he left Colombo at the beginning of April, and went *viâ* Ratnapura and Pelmadulla to Balangoda, in the neighbourhood of which place he stayed for some time, and then he took a trip over the hills to the low country round about Bintenne. In this neighbourhood he stayed altogether ten days, after which he made his way to Belihuloya, which he describes as most interesting country for naturalists, the hills round offering fine scope for the insect-trappers. Here he collected some very good specimens, principally dragon-flies of scientific interest. Beetles were also plentiful, and he was successful in obtaining some excellent specimens of the rare family of the *Cetonidæ*, and also captured one or two of the leaf-butterflies, which are so seldom seen, and so difficult to catch when seen, owing to the practice they have when pursued of flying to a bush or a tree, where their peculiar colour and shape, assimilating to the colour and shape of the leaves, render detection almost impossible. On May 6, Herr Frühstorfer went on, *viâ* Haldumulla and Koslande, to Wellaway, where he collected some beautiful butterflies, notably several specimens of the family known as *Papilios* (*montanus*). In the jungle near the Kottiyagalle estate, he captured some splendid butterflies, and an almost incredible number of grasshoppers. Here he collected, amongst other interesting specimens, a number of the insects which, from their red bodies and golden crests, are called "soldier" grasshoppers. Returning to Colombo for a time, he made an excursion to Panadura and the Bolgodde lakes, where he found centipedes of all kinds, including many rarities. On July 8 he journeyed to Kandy and Matale, and on to Dambool, where he stayed a week, and where he gathered his best specimens of *Orthopteras* or locusts, amongst them being some leaf-locusts of beautiful shape, and golden beetles, which are greatly in request by collectors and museums. While in the neighbourhood of Dambool he visited Anuradhapura, and thence he went on, over Habboorenna, to Kanthalai and Trincomalee, where he added to his store of butterflies.

Herr Frühstorfer, however, did not work alone. He employed altogether fourteen other collectors, who have been collecting for him in all parts of the island, and the result is that he has now a gigantic collection, the number of which he says it would be difficult to estimate; but he thinks he is well within the mark in saying that it includes 25,000 beetles, about 7000 butterflies, about 3000 *Orthopteras*, a like number of dragon-flies, and a thousand spiders and centipedes. He has a large number of butterflies and *Orthopteras* that are not to be found in the Colombo Museum; while, numerically speaking, he says he has more than three times the number of dragon-flies to be seen there. Amongst his most valuable specimens are the leaf-butterflies and locusts, and the long-horned beetles and *Mantidæ*. Besides all these, he has a good collection of snakes, amongst which are cobras, sea-snakes, and specimens of the *Uropeltidæ* and false snakes. Besides reptiles, Herr Frühstorfer has a valuable collection of shells. He describes Ceylon as being a very rich field for naturalists.

At the July meeting of the Anthropological Society of Bombay, Mr. Kitts, of the Indian Civil Service, read a paper on the early history of Northern India, in which the theory recently put forward by Mr. Hewitt, on the early history of India, was stated and discussed. The theory of Mr. Hewitt is briefly this:—That the first immigrants who settled in India and have left traces surviving were the so-called Kolarian races, who came from the north-east, and that their descendants, to the number of ten millions or thereabouts, are still occupants of Northern India. The Kolarians were succeeded and conquered by the Dravidians, who came from the north-west, and developed in India a very high state of civilization, both social and political. Large estates belonged to single owners, such as the *talukdari* tenures in Northern India, and the *zemindari* and *patidari* tenures in Southern India. "In short," says Mr. Hewitt, "it was the Dravidians who founded and consolidated the present land revenue system of India." The Dravidians also organized the *punchayet* and *chowkidar* system of village government, which has survived to the present day. All the manual arts and industries practised in the India of to-day were known to and practised by the Dravidians. The Aryans, migrating into a land occupied as India then was by the Dravidians, with a strongly-organized system of government, found great difficulty in obtaining a foothold, and even when they had secured a tract of country in the north-west for themselves, did not obtain supremacy over the rest of India by force of arms. The agents of their subsequent advance were three—religion, commerce, and military ability. Friendly alliances were concluded between the new-comers and the snake races of the Dravidians. The Aryans admitted the noble races of the Dravidians to be of royal blood, and accepted Siva or Lingam worship as not dishonouring to their religion. The Dravidians, thus recognized as of noble blood, were the ancestors of the modern Rajpoots and the Kshatriya caste. Intellectually the Aryans were far superior to the Dravidians, and the Aryan tongue was accordingly adopted as the *lingua franca* for commercial purposes. So, too, the Aryan became a necessary element in every court and in every commercial enterprise, and from this time forward (about six centuries B.C.) their supremacy was assured.

A recent issue of the Japanese *Official Gazette* contains an elaborate table showing the number of earthquake shocks felt in Tokio, and registered at the Central Observatory, from 1875 to 1889. The *Official Gazette* says that a large part of the area on which the city of Tokio stands, being of the character of alluvial deposit, is exceptionally sensitive to shocks of earthquake. These statistics, covering a period of fifteen years, unmistakably indicate the three closing and the three opening months of the year as the period of maximum seismic activity for Tokio. March is *the* month, *par excellence*, and next to it comes December. The order in respect to frequency of shocks is March, December, February, May, January, November, October, April, June, July, September, August.

In a special article of some length on the new Welsh Intermediate Education Act, the *Times* says that, while it recognizes, without supplanting, the higher elementary schools which were so warmly fostered by the Education Department half a dozen years ago, it takes power, not only to deal with intermediate or secondary education, properly so called, but also to become for Wales and Monmouth a Technical Education Act in everything but name. As a Secondary Education Act it will promote instruction in "Latin, Greek, the Welsh and English languages and literature, modern languages, mathematics, natural and applied science, . . . and generally in the higher branches of knowledge." As an Act for furthering technical education, it will promote the teaching of (1) any of the branches of science and art with respect to which grants are, for the time being, made by the Department of Science and Art; (2) the use of tools, and modelling in clay, wood, or other material; (3) commercial arithmetic, commercial geography, book-keeping, and shorthand; (4) any other subject applicable to the purposes of agriculture, industries, trade, or commercial life and practice, which may be specified in a scheme . . . as a form of instruction suited to the needs of the (particular) district. The only restriction to the fullest development of technical science to be aimed at under this Act is set forth in the proviso to the effect that any proposed course of technical instruction "shall not include teaching the practice of any trade, or industry, or employment."

A RECENT issue of the French *Journal Officiel* contains the Report which M. Bouchon-Brandely, Inspector-General of Marine Fisheries in France, has made to the Minister of Marine, on the subject of the cultivation and condition of the natural oyster-banks of Brittany. He visited St. Malo, where he reports the Roma, a river in which oysters have grown for the last fifty years, as being a spot eminently favourable for experiments, on a large scale, in the improved cultivation of this shell-fish. The oysters have been wastefully neglected in the Roma, and at the present time the industry appears to be almost ruined, but to be capable, with a little care, of being restored to a condition of very great importance. Proceeding westward, he found the Bay of St. Brieuc, once a rich oyster-field, entirely destroyed by the reckless use of the dredge. A little further, at Tréguier, he found the oyster-beds still existing which produce the famous Breton oyster, a fish rather larger than the Ostend variety, and not a whit inferior to it in flavour. The fishermen have fished to excess, in spite of all official warnings; they have left the beds no rest or time for growth. The Report suggests a return to the regulations of 1750, by which oyster-fishing in the creek of Tréguier was permitted only once in six years; or, if this be considered too long a close season for practical purposes, to prohibit the fishing for two years at least, during that period to cleanse and tend the beds, to check the wastefulness of the people of the locality, who are in the habit of helping themselves freely to oysters, and to arrange that an ordinary tide, and not the lowest tide in the year, should be chosen for the periodical general fishery. The Report speaks with considerable bitterness of the total destruction of the once flourishing oyster-beds of the Roads of Brest, ruined by every kind of wasteful and improvident fishing. M. Bouchon-Brandely is of opinion that these beds deserve to be replanted, and that, if proper care be taken to protect them, there is no reason why they should not flourish. But it will be necessary, by some penal regulation, to check poaching; and he believes that the expense of maintaining keepers on the oyster-beds would be amply repaid by the profits which would result from the prevention of poaching. Along the coast of the Morbihan the oyster-beds were found to be in a condition much less exhausted than in Finistère, and to be recovering. In the neighbourhood of Vannes a little steamer goes to and fro, watching the oyster-beds, and seeing that they are not disturbed by poachers—a proceeding which has been found to be of excellent service in preserving the fish. At every point, M. Bouchon-Brandely found that the rapacity of the dredgers and the constant disturbance of the young shells had been the principal causes of the rapid decline in the value of the Breton oyster-beds—a decline which has induced the Ministry of Marine to intrust him with these investigations.

THE following observations on the subject of agricultural laboratories in Belgium are taken from a report recently issued by the Agricultural Department of the Privy Council. Every person living in Belgium who purchases not less than a ton of feeding stuffs can have samples of these analyzed, free of cost, at the agricultural laboratory which exercises jurisdiction in the province in which the purchaser resides. In the last number of the *Bulletin de l'Agriculture*, published by the Minister of Agriculture in Belgium, there is a valuable report from the Commissioners appointed to superintend the establishment of agricultural laboratories and to inspect them periodically. From this it appears that there are now seven agricultural laboratories in Belgium where gratuitous analyses of manures and feeding stuffs are made. By a Royal decree, dated August 1887, the agricultural station at Gembloux was reorganized and a distinct agricultural laboratory was attached to it. Besides this there are agricultural laboratories at Gand, Liége, Hasselt, Anvers, Mons, and Louvain. Not only are analyses supplied by these institutions, but information is furnished to agriculturists upon the rational employment of manures, and the best modes of using various feeding stuffs as well as upon other agricultural points. At the station of Gembloux alone there were 227 consultations with agriculturists upon divers questions of agronomy.

A MEMORANDUM by Mr. Charles Whitehead, Agricultural Adviser to the Privy Council, on the subject of the introduction of insects injurious to corn and corn crops in wheat imported from India, has recently been issued. Mr. Whitehead says that the foreign matter mixed with wheat imported from India into this country serves as a medium for the wholesale transportation of insects injurious to crops. From the cleaning of Indian wheat several categories are formed at the flour-mills. One consists of short pieces of straw of from one inch to two inches and a half long, with pieces of wheat ears. This is sold for litter, and is distributed among various farms in the neighbourhood of the mills. In this straw the most dangerous corn insects might be introduced—insects of the type of the Hessian fly, of the *Isosoma Hordei*, the joint worm whose appearance in Great Britain is feared by agricultural entomologists. Another comprises light and misshapen grains of corn with weed seeds, known in this country as "screenings," and which ought to have been taken out of the bulk by the Indian producers. This is purchased for pigs' and chickens' food, being therefore scattered over the face of the land. In this, corn weevils especially and other insects may easily be conveyed. It is well known that weevils are most destructive to wheat and other grains in India. It is also equally well known that they are brought over to British ports and granaries in abundant quantities with Indian wheat. One species of weevil, the *Calandra oryzæ*, the rice weevil, does enormous harm to wheat in Indian granaries, and to wheat while it is being transported in vessels to this country. The admixture of dirt, seeds, and rubbish causes the wheat to heat, which of course is detrimental to its quality, and at the same time causes weevils to propagate unusually and to materially damage it. Sometimes the cargoes of wheat that have been heated are nearly alive with weevils, causing great waste and heavy loss to importers. This loss continues when the bulk is taken to granaries or warehouses where the heat is still evolved, and the weevils revel in it. The amount of loss occasioned by this weevil is estimated at an average of $2\frac{1}{2}$ per cent. Taking the value of wheat exported at £6,000,000, the amount of loss due to this insect in exported wheat alone equals £150,000. Another weevil, the *Calandra granaria*, closely allied to

Calandra oryzæ, is also brought over with Indian wheat. This weevil is known in British and other European granaries, but it is presumed that the heat and surrounding circumstances of cargoes of Indian wheat favour its development, and stimulate its powers of destruction. As it breeds freely in this country, the danger of its distribution is great. Besides the actual money loss occasioned by these weevils, it is stated that the flour made from wheat much infested by them is injurious to health.

THE French Consul-General to Bolivia, in a recent Report to his Government, gives some interesting remarks on the population of that remote State. The population, he says, consists of about 1,300,000 persons, and is not homogeneous ; it consists of the white race, descendants of Europeans, the Indian, the original inhabitants of the country, and the Mestizos, called Cholos, a mixture of Europeans and Indians. The Indians form more than half the population, and the white race about one-quarter. The manners and customs of the Bolivians vary according to the social group ; the white race have much the same customs as Europeans. Special mention is made of a national spice probably little known in Europe. This is pimento (*agi*) which burns the palate, and is largely used in all Bolivian food, and forms an important article of commerce. The continual use of such a hot condiment hardens the mouth, and explains the ease with which nearly all Bolivians can take the strongest spirits. The Indian has very different customs. He sustains himself during work or when hunting by chewing the leaves of the coca, and always carries a quantity with him wherever he goes. As he is addicted to drink, he gets drunk whenever he can. His favourite drink is pure alcohol. On high ground the Indian wears a particular dress summer and winter. This consists of loose drawers, made of coarse linen, which leave the lower part of the legs and feet bare, over these a linen tunic, and a poncho which is used as a mantle. He is accustomed to a hard life, and sleeps in the open air, covered only by a piece of linen, no matter what the weather may be. The morals of the Indian are more than doubtful. His black and glossy hair never receives attention, his red skin acquires a dark colour from the dust which accumulates on his body and becomes part of his epidermis. On *fête* days, men and women cover themselves with tinsel, skins of wild beasts, feathers of every shade, and dance and drink until exhausted by fatigue and drunkenness they throw themselves on the ground. This race, which is interesting from the novel spectacle it presents to the stranger, has but little apprehension of the benefits of civilization ; it carries on, however, the agriculture of the country. The Cholo or half-castes already mentioned belong to the least estimable part of the population. They get drunk frequently and work little ; they wear trousers and a vest, over which is thrown a poncho. They are almost always immoral and dishonest ; wherever there is a disturbance there they are to be found. They are the handicraftsmen of Bolivia, and are not without some skill.

THE *Meteorologische Zeitschrift* for August contains a discussion of the daily period of the humidity in Christiania, by J. F. Schrœter, based upon an old series of hourly observations made at the Observatory between 1841 and 1847. The vapour-tension exhibits the usual periods of double maxima and minima. The relative humidity shows a strongly-marked maximum in the morning, and minimum in the afternoon ; the epoch of the maximum occurs earlier from the winter to the summer solstice, and *vice versâ*. Dr. A. Wachlowski contributes a paper on the rainfall of Galicia. The yearly period is a very simple one ; there is a maximum in July, and a minimum in January and February. The country is divided into seven districts, in which the annual rainfall varies from 24½ to 26½ inches.

THE additions to the Zoological Society's Gardens during the past week include a Common Marmoset (*Hapale jacchus*) from Brazil, presented by Mr. James Waddell ; three Bengal Foxes (*Canis bengalensis*) from India, presented by Colonel Creek ; a Common Badger (*Meles taxus*), British, presented by Mr. G. H. Hulme ; a Grey Ichneumon (*Herpestes griseus*) from India, presented by Miss Colvin ; a Crested Porcupine (*Hystrix cristata*) from Ceylon, presented by Captain Rose ; a Ringed Plover (*Ægialitis hiaticula*), British, presented by Mr. H. M. Upcher ; a Red-billed Tree Duck (*Dendrocygna autumnalis*) from India, presented by Mrs. Alfred Oakes ; five Hobbies (*Falco subbuteo*) from Spain, deposited ; two Upland Geese (*Bernicla magellanica*, var. *dispar*, ♂ ♀) from Patagonia, two Spur-winged Geese (*Plectropterus gambensis*) from West Africa, two Black-backed Geese (*Sarcidiornis melanonota*) from India, purchased.

OUR ASTRONOMICAL COLUMN.

THE TRIPLE STAR Σ 2400.—In the year 1884 a third star was discovered by M. Perrotin, lying nearly midway between the two components which had been discovered by Struve in 1829. Mr. Burnham, writing to the *Observatory* under date July 31, 1889, now points out that the observations made of the three stars show that the change in position of the two companion stars is wholly due to the proper motion of the principal star, that the two fainter stars are substantially fixed with regard to each other, and may possibly prove to be physically connected, though with but slow motion, and that, thirdly, Struve's observation in 1872 was of the new, and not of the old, companion. It appears curious that the inner companion was not discovered earlier, as it is almost as bright as the outer one. The large star is moving away from the fainter, so that measurements will be rendered easier in the future.

THE POTSDAM OBSERVATORY.—The second part of the fourth volume of the Publications of this Observatory has just appeared. It is given up to solar physics, the heliographic latitudes and longitudes of the sun-spots from 1880–84 forming the first section ; Herr Wilsing's research (see NATURE, vol. xxxviii. p. 206, June 28, 1888) on the rotation period of the sun as derived from the observation of faculæ, the second ; and a description of Dr. Lohse's photoheliograph, and of the method employed at the Observatory for the measurement of the solar photographs, the remainder of the volume.

THE OBSERVATION OF SUDDEN PHENOMENA.—Prof. Langley, in the *Sidereal Messenger* for August, proposes a method for greatly diminishing personality in the observation of sudden phenomena, such as the disappearance of a star when occulted by the moon. The principle of the method, which is susceptible of a wide application, consists in associating a motion, real or apparent, of the object with intervals of time, so that the apparent position of the object at any occurrence being noted, the time of the occurrence will be known. For the apparent position, say, of a star at occultation is an integral part of the phenomenon observed, and does not depend for its correct estimation upon the rapidity with which the mind can pass from one order of impressions, as the sight of a star in the field of a telescope, to another, such as the estimation of the interval that has elapsed from the last beat of a pendulum. Some preliminary experiments with an eyepiece, in which the star under observation was made to appear to revolve once in a second, showed that it was quite possible to observe an occultation with a probable error of only one-fortieth of a second.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1889 SEPTEMBER 15–21.

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24 is here employed.)

At Greenwich on September 15

Sun rises, 5h. 37m. ; souths, 11h. 55m. 1·0s. ; daily decrease of southing, 21·2s. ; sets, 18h. 13m. : right asc. on meridian, 11h. 33·6m. ; decl. 2° 52′ N. Sidereal Time at Sunset, 17h. 53m.

Moon (at Last Quarter September 17, 5h.) rises, 20h. 41m.* ; souths, 4h. 18m. ; sets, 12h. 7m. : right asc. on meridian, 3h. 55·3m. ; decl. 17° 7′ N.